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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appl. No.: 10/665,605

Applicant: Robert T. Bigelow

Filed: 09/16/2003

Title: Modular Human Habitat Simulator

TC/A.U.: 3715

Examiner: Cameron Saadat

Docket No.: BA-U-SIM-00010

Confirmation No.: 6384

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# APPEAL BRIEF

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Alexandria, VA 22313-1450

Sir:

The present Brief is submitted in triplicate in support of an appeal from the October 16, 2006 Final Rejection of Claims 1 – 19. The Notice of Appeal was timely filed on October 26, 2006 via first-class mail. Appellant respectfully seeks to have the rejection of Claims 1 – 19 overturned.

**Table of Contents**

## REAL PARTY IN INTEREST

The real party in interest is Bigelow Aerospace, North Las Vegas, NV, by assignment recorded 09/16/2003 (Reel 014616, Frame 0243). The inventor of the present application assigned his interests to Bigelow Aerospace by assignment executed on 09/16/2003.

## RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to the Appellant, or the Appellant's legal representative, that will directly affect the Board's decision in the pending appeal.

## STATUS OF CLAIMS

Claims finally rejected: 1 – 19

Claims appealed: 1 - 19

Claims pending: 1 – 19

Claims allowed: none

Claims withdrawn: none

Claims cancelled: none

## STATUS OF AMENDMENTS

There are no amendments.

## SUMMARY OF THE CLAIMED SUBJECT MATTER

The invention relates to a simulator based upon characteristics of a deployed inflatable modular human habitat. The simulator has a rigid wall that is constructed of a material such as metal or plastic.

## GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claim 1-19 are unpatentable under 35 USC § 103 for being obvious in light of Raboin et al. (USPN 6,547,189; "Raboin") and Taylor (USPN 6,439,508; "Taylor").

## RESPONSE TO ARGUMENTS

### 1. Synopsis of the Response

The limitation of a "rigid shell" appearing within independent Claims 1 and 17 was improperly interpreted by the Examiner to include the solid core of an inflatable spacecraft. However, Claims 1 and 17 of the instant application specifically limit the "rigid shell" to generally the shape of the interior surface of the flexible cover on the inflatable spacecraft thereby affirmatively excluding the solid core.

A soft shelled simulator requiring the use of a vacuum was also identified in the prior art. The simulator of the present invention is solid shelled and does not require a vacuum to operate.

### 2. The "rigid shell" limitation in Claim 1 was improperly interpreted to read upon the solid core of a spacecraft and this error undermines all of the claim rejections

A pertinent section of Claim 1 of the instant application identifies that the "rigid wall" has the general shape of the interior surface of a deployed inflatable shell:

> "1. A modular human habitat simulator comprising:
> a housing having a rigid wall defining an internal volume, a longitudinal axis, a first opening and second opening being opposed along the longitudinal axis, an external surface, and the rigid wall having an interior surface of generally the shape of a deployed inflatable shell internal surface of a modular human habitat, and the internal volume being substantially that of a deployed inflatable

modular human habitat volume;..." Excerpt of Claim 1, emphasis added.

The rigid wall of the Applicant's invention generally models the geometry of the inside surface of a deployed inflatable habitat. The rigid wall 114 is clearly indicated in Fig. 1 of the present application reproduced below.

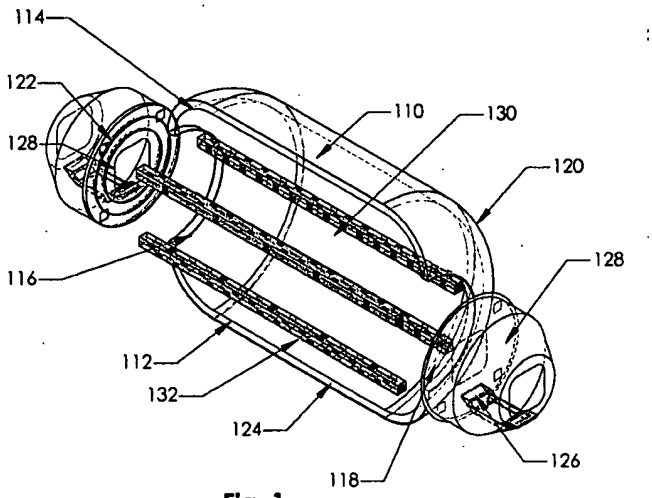


Fig. 1

Applicant's specification identifies the characteristics of the rigid wall 114 of the present invention:

"[0041] The distal enclosures are hollow and can be used as a simulated airlock to another craft, a passage 128 into the internal volume 130, and/or storage. The rigid wall 114 can be of any rigid material including metal, metal composite, or other type of non-metal rigid matter. In the preferred embodiment, the rigid wall 114, and the first distal enclosure 122 and the second distal enclosure 126 are made of steel. In an alternative embodiment, the wall may also be a substantially rigid wall where the wall exhibits some degree of flexibility. In such a case, the substantially rigid wall may be of a

composite material or an alloy that allows for a certain amount of movement." (Emphasis added).

The "rigid wall" of the present invention is formed to closely approximate the shape of the inside surface of the inflation layer of a deployed inflatable spacecraft. The "rigid wall" can be composed of materials such as metal or metal composites. This was not how the Examiner defined the "rigid wall."

In the Final Rejection dated October 3, 2006, the Examiner rejected all of the claims as follows:

"Raboin discloses a modular human habitat system comprising; an inflatable housing having a rigid wall (See Col. 3, lines 45-48)..."

The excerpt referenced in Raboin by the Examiner appears below.

"...an interface between the flexible bladder and load bearing restraint layer and a rigid structural interface such as an airlock, entry hatch, window, and inflation/monitoring ports." (Emphasis added).

The Examiner supports this position later in the Final Rejection by referring to Raboin (Column 6, lines 55-66) as disclosing a human habitat system having a rigid walled housing. The reference is reproduced below.

"As best seen in FIGS. 3 and 4, structural core 100 is preferably generally cylindrical in shape and includes a longitudinal axis 101. In addition, structural core 100 is preferably composed of, or preferably includes, at least one longeron 102, at least one body ring 104, two endplates 106, and two end rings 116. The two endplates 106 correspond to the circular ends of the structural core's 100 cylindrical

shape. Each longeron 102 extends in a direction parallel to the longitudinal axis 101 of the cylindrical shape and is fixedly attached to one of the two end plates 106. Each body ring 104 is fixedly attached to each longeron 102.

Corresponding to the ends of the structural core's 100 cylindrical shape, each end plate 106 is circular in shape."

The excerpt from Raboin addresses the internal core structure of the inflatable craft. The structural core is a solid unit comprised of longerons 102, body rings 104, and endplates 106. These structures are associated with solid elements as clearly indicated in Flg 4 below.

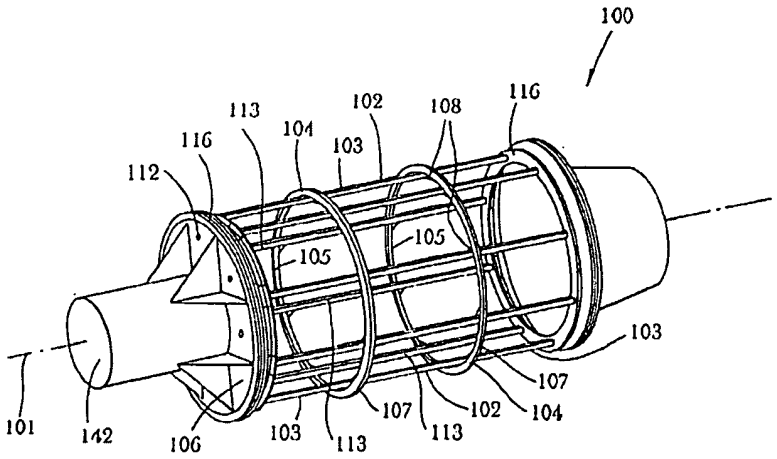



Fig. 4

Clearly, the "rigid shell" of the present invention has no relationship to the core of Fig. 4.

The Final Rejection was based upon an improper interpretation of the limitation of a "rigid wall" that was inclusive of the solid core structure of an inflatable modular craft.

There is nothing in Raboin that remotely has any relationship to the shape characteristic of the rigid wall of the present invention. The airlock, entry hatch, window, and inflation monitoring ports cited from Raboin in the Final Rejection are not rigid walls having an interior surface that conforms to the geometry of the inside surface of a deployed inflatable module.

This basic misunderstanding of the scope of, "a housing having a rigid wall defining an internal volume" and the limitation of a "rigid wall" undermines all the arguments in the First Office Action and the Final Rejection.

**3. Claims 1, and 17 – 19 were rejected for obviousness under 35 USC § 103**

The Examiner identified the following basis for issuing the Final Rejection as to Claims 1, and 17-19:

> "Raboin discloses a modular human habitat system comprising; an inflatable housing having a rigid wall (See Col. 3, lines 45-48) defining an internal volume 100, a longitudinal axis, first and second opening 106 being opposed along the longitudinal axis (Col. 6, lines 55-66; col. 10, lines 24-29), an external surface, and the rigid wall having an interior surface of generally the shape of a deployed inflatable shell 200, and the internal volume being substantially that of a deployed inflatable modular human habitat volume; a first distal enclosure having a first and second end 106 being opposed along a longitudinal axis, a first aperture on the first end and a second aperture on the second end forming a passage therethrough, and the first distal enclosure is connected tot eh housing such that the passage aligns with the first opening of the housing thereby providing access to the internal volume (See Fig. 1); and a second distal enclosure having a first end and a second end being opposed along a longitudinal axis, a

hollow interior, and a first opening on the first end and the second distal enclosure being connected to the housing such that a passageway is formed between the hollow interior and the internal volume. See Col. 2, lines 2-18; Fig. 1. Raboin discloses all of the claimed subject matter with the exception of explicitly disclosing that the modular human habitat system is a simulator. However, Taylor teaches that it is well known to fabricate a human habitat system in a prototype design and in order to provide testing in a simulated environment (Col. 6, lines 34-38). Thus, in view of Taylor, it would have been obvious to one of ordinary skill in the art to modify the human habitat system described in Raboin, by testing the system in a simulated environment, in order to discover necessary modifications before actual deployment."

**A. Rigid Walled Structure**

The Examiner maintains that:

" ...Raboin discloses a modular human habitat system comprising an inflatable housing having a rigid wall (See Col. 3, lines 45-48)..." Detailed Action, page 2.

The excerpt referenced appears below.

"...an interface between the flexible bladder and load bearing restraint layer and a rigid structural interface such as an airlock, entry hatch, window, and inflation/monitoring ports."

Notably, the excerpt does not address a rigid wall structure where the interior surface of the rigid wall has the characteristic shape of the inside of the deployed

flexible shell as specifically identified in Claim 1 of the instant application as discussed supra.

Raboin (Column 6, lines 55-66) is referenced in the Final Action as disclosing a human habitat system having a rigid walled housing. The reference is reproduced below.

> "As best seen in FIGS. 3 and 4, structural core 100 is preferably generally cylindrical in shape and includes a longitudinal axis 101. In addition, structural core 100 is preferably composed of, or preferably includes, at least one longeron 102, at least one body ring 104, two endplates 106, and two end rings 116. The two endplates 106 correspond to the circular ends of the structural core's 100 cylindrical shape. Each longeron 102 extends in a direction parallel to the longitudinal axis 101 of the cylindrical shape and is fixedly attached to one of the two end plates 106. Each body ring 104 is fixedly attached to each longeron 102.
> Corresponding to the ends of the structural core's 100 cylindrical shape, each end plate 106 is circular in shape."

The excerpt from Raboin addresses the internal core structure of the inflatable craft. The structural core is a solid unit comprised of longerons 102, body rings 104, and endplates 106. These structures are associated with solid elements. This passage does not address the flexible shell of the craft, but rather the supporting core. The passage certainly does not relate in any fashion to a rigid wall having the general shape characteristics of the inside of the soft shell of a deployed inflatable craft as in the present application.

Fig. 4 is especially clear on the solid structural nature of the structural core 100 (Raboin Column 7, starting at line 32, referring to Fig. 4) as shown below.

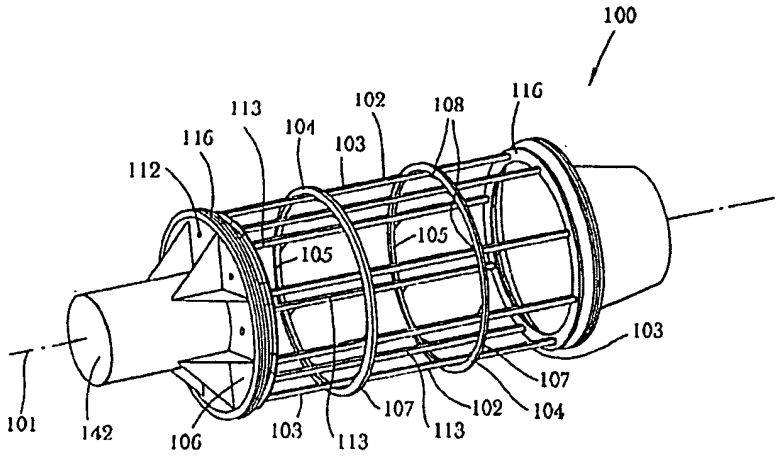



Fig. 4

However, this structural core 100 is distinct from the flexible outer layers. As shown below in contrast, the inflatable shell 200 is attached to the solid core.

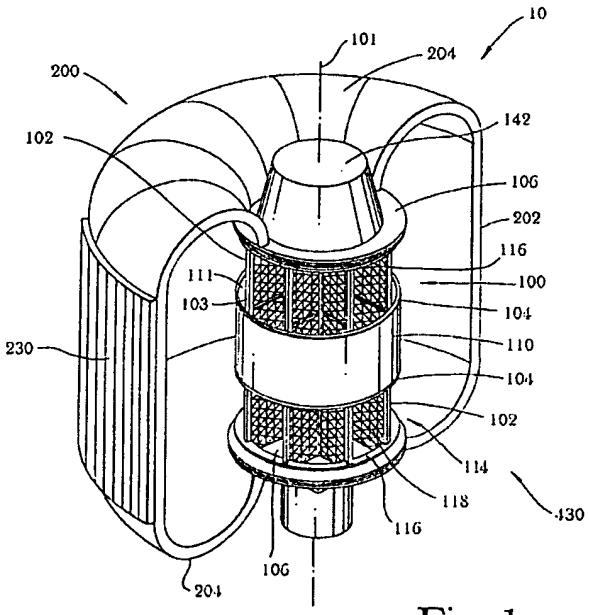



Fig. 1

This distinction is identified in Column 2 of Raboin:

> "To achieve such objectives, the invention includes a module that generally comprises a structural core and an inflatable shell. The inflatable shell is searingly attached to the structural core. In its pre-deployment or launch configuration, the interior and thickness of the inflatable shell may be collapsed by vacuum. Also in this configuration, the inflatable shell may be efficiently folded around the structural core, and for space flight, the module may be loaded into the payload bay of an existing launch vehicle, such as the Space Shuttle. On location, in orbit for example, the module is deployed, the inflatable shell is inflated, and the module achieves its deployed configuration. In its deployed configuration, the thickness of the inflatable shell automatically expands from its collapsed state to its full thickness, and the inflatable shell is inflated around the structural core, defining therein a large volume useable, for example, as habitable space for astronauts." (Emphasis added).

While the core is structural and can be solid, the external inflatable shell is malleable. This distinction necessarily flows from the fact that the Raboin reference addresses an inflatable craft. The use of a solid external shell would undermine the Raboin invention.

As discussed above, the "rigid wall" of the present invention forms substantially to the geometry of the internal surface of the malleable covering of a deployed and inflated module; not to the solid core.

**B. Simulator**

Taylor was relied upon for the proposition that it would have been, "obvious to one of ordinary skill in the art to modify the human habitat system described in

Raboin, by testing the system in a simulated environment, in order to discover necessary modifications before actual deployment."

The excerpt of the Taylor patent as referenced in the Office Action appears below.

> "A second part of the present invention includes the inventor's enhancements to the NASA TransHab Concept. The NASA device was fabricated in a prototype design and tested in a large vacuum chamber but used a simple design not generally used in the composite industry." Taylor Column 6, starting at line 34.

While the reference does identify a prototype design, it is clear that the inventor is referring to a prototype of the inflatable shell TransHab concept. What is referenced by Taylor is a flexible shell, which was the type of shell used in the TransHab design. It was the inflatable shell that gave TrasnHab its unique character.

In further reference to this passage, the simulation that is being performed in on the inflatable shell structure of the TransHab in a vacuum chamber. When inflated in a vacuum, the TransHab shell is in the deployed state, however this does not change the characteristic of the malleable shell to being a rigid shell as in the present invention.

Applicant's specification identifies the characteristics of the rigid wall of the present invention:

> "[0041] The distal enclosures are hollow and can be used as a simulated airlock to another craft, a passage 128 into the internal volume 130, and/or storage. <u>The rigid wall 114 can be of any rigid material including metal, metal composite, or other type of non-metal</u>

rigid matter. In the preferred embodiment, the rigid wall 114, and the first distal enclosure 122 and the second distal enclosure 126 are made of steel. In an alternative embodiment, the wall may also be a substantially rigid wall where the wall exhibits some degree of flexibility. In such a case, the substantially rigid wall may be of a composite material or an alloy that allows for a certain amount of movement." (Emphasis added).

Clearly, the rigid wall of the present invention does not extend to the flexible materials used in the TransHab shell. If the TransHab shell were comprised, for example, of steel, then the very purpose of the TransHab would be undermined. Furthermore, the present invention does not address any vacuum chamber testing of an inflatable shell TrasnHab type prototype design.

**2. Claims 2-16**

Regarding claim 2, Raboin discloses a flexible shelled system with a longeron. However, as discussed supra, the combination of the longeron with a simulator having a solid shell is not identified in Raboin.

Regarding claim 3, Raboin discloses a flexible shelled system with a window. However, as discussed supra, the combination of the window with a simulator having a solid shell is not identified in Raboin.

Regarding claim 4, Raboin discloses a flexible shelled system with an opening through the second distal enclosure. However, as discussed supra, the combination of the opening through a second distal enclosure with a simulator having a solid shell is not identified in Raboin.

Regarding claim 5, Raboin discloses a flexible shelled system with a debris shield. However, as discussed supra, the combination of the debris shield with a simulator having a solid shell is not identified in Raboin.

Rearding claim 6, Raboin discloses a flexible shelled system with a plurality of water bags. However, as discussed supra, the combination of the water bags with a simulator having a solid shell is not identified in Raboin.

Regarding claim 7, Raboin discloses a flexible shelled system with a floor structure and means for supporting the floor structure and the floor structure extending substantially the length of the longitudinal axis and substantially dividing the internal volume into an upper internal space and a lower internal space. However, as discussed supra, the combination of a floor structure and means for supporting the floor structure and the floor structure extending substantially the length of the longitudinal axis and substantially dividing the internal volume into an upper internal space and a lower internal space with a simulator having a solid shell is not identified in Raboin.

Rearding claim 8, Raboin discloses a flexible shelled system with an access opening. However, as discussed supra, the combination of the access opening with a simulator having a solid shell is not identified in Raboin.

Rearding claim 9, Raboin discloses a flexible shelled system with a plurality of floor structures, means for supporting the plurality of floor structures and the plurality of floor structures extending substantially the length of the longitudinal axis and substantially dividing the internal volume into a plurality of internal spaces. However, as discussed supra, the combination of a plurality of floor structures, means for supporting the plurality of floor structures and the plurality of floor structures extending substantially the length of the longitudinal axis and substantially dividing the internal volume into a plurality of internal spaces with a simulator having a solid

shell is not identified in Raboin. Further, as discussed supra, the prior art does not disclose a simulator of an inflatable spacecraft where the shell of the simulator is solid.

Rearding claim 10, Raboin discloses a flexible shelled system with an access opening in at lease one floor structure. However, as discussed supra, the combination of the access opening in at least one floor structure with a simulator having a solid shell is not identified in Raboin.

Rearding claim 11, Raboin discusses the cylindrical aspect of the invention, but does not address a plurality of cylinders disposed within and fixedly attached to, the first distal enclosure. Even so, as discussed supra, the combination of a plurality of cylinders disposed within and fixedly attached to the first distal enclosure with a simulator having a solid shell is not identified in Raboin.

Rearding claim 12, Raboin discusses the cylindrical aspect of the invention, but does not address a plurality of cylinders disposed within and fixedly attached to, the second distal enclosure. Even so, as discussed supra, the combination of a plurality of cylinders disposed within and fixedly attached to the second distal enclosure with a simulator having a solid shell is not identified in Raboin.

Rearding claim 13, Raboin discusses the cylindrical aspect of the invention, but does not address a plurality of cylinders disposed along, fixedly attached to, the external surface of the first distal enclosure. Even so, as discussed supra, the combination of the access opening in at least one floor structure with a simulator having a solid shell is not identified in Raboin.

Rearding claim 14, Raboin discusses the cylindrical aspect of the invention, but does not address a plurality of cylinders disposed along, and fixedly attached to, the external surface of the second distal enclosure. Even so, as discussed supra, the combination of a plurality of cylinders disposed along, and fixedly attached to, the

external surface of the second distal enclosure with a simulator having a solid shell is not identified in Raboin.

Rearding claim 15, Raboin discusses panels, but does not address simulated panels. Even so, as discussed supra, the combination of simulated panels with a simulator having a solid shell is not identified in Raboin.

Rearding claim 16, Raboin discusses the cylindrical aspect of the invention, but does not address a plurality of cylinders fixedly attached to the internal surface. Even so, as discussed supra, the combination of a plurality of cylinders fixedly attached to the internal surface with a simulator having a solid shell is not identified in Raboin.

**3. The Legal Standard for Finding Obviousness was not met**

**A. The prior art reference(s) don not teach all the limitations of the claimed invention**

Also, the prior art reference (or references when combined) must teach all the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir. 1991). The limitation of a rigid wall having an internal surface that generally conforms to the internal surface of a deployed inflatable vessel is missing entirely from the prior art cited. The Examiner relies upon Taylor to identify a simulator being a deployed module in a vacuum chamber that does not have a rigid shell.

**B. The claimed invention as a whole was not obvious**

In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983). Nothing

cited by the Examiner identifies the principal of a simulator having a rigid wall that mimics the internal shape characteristic of a deployed inflatable spacecraft. This principal is not in the prior art. The Final Rejection fails to provide any evidence that such a simulator would have been obvious in the prior art.

**C. There is no showing of a teaching, reason, suggestion, or motivation to combine the references**

It is well-established that before a conclusion of obviousness may be made based on a combination of references, there must have been a reason, suggestion, or motivation to lead an inventor to combine those references. *ACS Hosp. Sys., Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 USPQ 929, 933; *Pro-Mold and Tool Co., Inc. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573 (C.A.Fed. 1996). "When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references." *In re Rouffet*, 149 F.3d 1350, 1355, 47 U.S.P.Q.2D (BNA) 1453, 1456 (Fed. Cir. 1998) (citing *In re Geiger*, 815 F.2d 686, 688, 2 U.S.P.Q.2D (BNA) 1276, 1278 (Fed. Cir. 1987)). "[T]he examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed." Id at 1357. "Rarely, however, will the skill in the art component operate to supply missing knowledge or prior art to reach an obviousness judgment." *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 1320, 50 USPQ2d 1161 (Fed. Cir. 1999) ("To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher."). In the present case, the Raboin and Taylor references are used in concert to support the obviousness rejection. However, neither reference teaches, or even suggests, the invention of a solid shelled simulator. Moreover, neither references are directed to a simulator where the inside wall is rigid and substantially in the shape of the inside shell of a deployed and inflated modular

structure. The Examiner failed to identify what would have motivated someone at the time of the invention to combine Raboin and Taylor. Taylor does not teach simulators with a rigid internal walls. Raboin is entirely silent on a simulator all together. Nothing in the record provides guidance to combine Raboin and Taylor and add the missing limitation of a rigid wall. Further, there is no support in the Final Rejection for finding that a person of ordinary skill in the art could provide such missing information.

**D. There is no clear and particular showing of obviousness**

To reject an inventor's claim for obviousness in view of a combination of prior art references, a showing of a suggestion, teaching, or motivation must be, "clear and particular". *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Such factual findings must be supported by "concrete evidence in the record". *In re Zurko*, 258 F. 3d 1379, 1358-86, 59 USPQ2D 1693, 1697 (Fed. Cir. 2001). In Taylor and Raboin the spacecrafts have flexible outer layers. By requiring the outer layers to be solid, the Raboin and Taylor inventions would not be able to be compressed to fit into a fairing before launch and subsequently inflated to a larger volume. These are two critical aspects to the Raboin and Taylor inventions. Such a transposition would render Raboin and Taylor inoperable for their respective intended uses. Neither reference discusses the case of a simulator having a solid outer shell based upon characteristics, such as deployment size, of an inflatable shell craft similar to the TransHab concept. None of the prior art references shows or suggests the properties and results of the claimed structure, or suggests the claimed combination as a solution to the problem of a simulator for an inflatable spacecraft.

**E. There was no showing of a desirability to modify or combine the references**

The mere fact that references may be modified or combined does not make the modification or combination obvious unless the prior art suggested the desirability of the modification or combination. *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992).

Nothing proffered by the Examiner shows the desirability of combining Raboin and Taylor and then adding the missing limitation of the rigid wall being in the shape of an inflated spacecraft.

**F. Hindsight is not permitted**

"Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention." *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 546, 48 USPQ2d 1321, 1329 (Fed.Cir.1998). "[T]he very ease with which the invention can be understood may prompt one to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher." *In re Kotzab*, 217 F.3d 1365, 1369 (Fed.Cir.2000). The fact that there is no suggestion, teaching, or motivation to combine appears to indicate that the choice of Raboin and Taylor were entirely based upon culling out specific limitations appearing in the claims of the present application from the prior art. There was no explanation in the Final Rejection as to why a person of skill in the art would even choose Raboin and Taylor. Without such support, it seems the direction could have only come from the pending specification. This is impermissible.

**G. Teaching away negates obviousness**

The Federal Circuit has held that references, "that teach away cannot serve to cerate a prima facie case of obviousness". *In re Gurley*, 27 F.3d 551, 553, 31 U.S.P.Q.2D (BNA) 1130, 1132 (Fed. Cir. 1994)). The prior art teaches away where the proposed combination or modification renders the prior art inoperable. *In re Gordon*, 733 F.2d 900, 24 USPQ 1125, 1127 (Fed.Cir. 1988). Taylor does not teach a solid shelled simulator. Taylor professes the advantages to a soft shelled simulator used in conjunction with a vacuum chamber. If a person of skill in the art would substitute a rigid shelled craft in place of the soft covered craft in Taylor, then the vacuum chamber identified in Taylor would be unnecessary. This would render the

Taylor reference inoperable. Further, the direction in Taylor toward a soft covered craft is opposite the direction where the simulator is not in a vacuum and would have a rigid shell.

**H. Obviousness requires an objective standard**

The office action must clearly and objectively prove some suggestion, motivation or teaching in the prior art that would have led a person of ordinary skill in the art to; 1) select the reference; 2) select the teachings of the separate references, and; 3) combine those teachings in the way that would produce the claimed invention. *In re Johnson*, 435 F.3d 1382 (Fed. Cir. 2006), see also *In re Dance,* 160 F.3d 1339, 1343, 48 USPQ2D 1635, 1637 (Fed.Cir. 1998) and *Interconnect Planning Corp. v. Feil*, 774 F. 2d 1132, 1143, 227 USPQ2D 543, 551 (Fed.Cir. 1985). The Final Rejection is entirely lacking on this point. There is no showing as to why a person of skill in the art would choose Raboin and Taylor, or why such a person would choose the specific limitations relied upon for the final rejection of the claims, or what would motivate such a person to combine the references to arrive at the present invention.

**I. The combinations cited render the reference to a simulator inoperable**

There is no motivation to combine where the modification would render the reference inoperable for its intended use. *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1354 (Fed, Cir. 2001) (adding finger marks to secondary reference of a baseball to arrive at an instructional pitching device would render the baseball unusable for its intended purpose). In the present case, to implement a solid shell in the Raboin reference would vitiate the core of the invention. Raboin was directed to a spacecraft with a flexible shell. The same is true as to the Taylor reference. If a solid shelled craft were used in Taylor, then the express reliance on a vacuum chamber becomes a nullity.

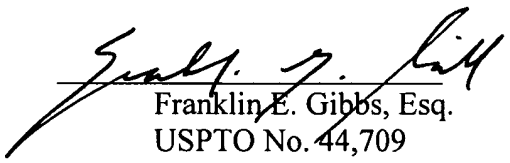
**4. Summary**

For the foregoing reasons, Applicant maintains that neither the Raboin nor Taylor references, together or individually, render the invention of the instant application obvious. The Board of Patent Appeals and Interferences is respectfully requested to overturn the Examiner's rejections of Claims 1 – 19.

If the Applicant's attorney can be of any further assistance, please call the undersigned at the number provided.

Respectfully submitted,

Dated: 11-28-06



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## CLAIMS APPENDIX

1. A modular human habitat simulator comprising:

a housing having a rigid wall defining an internal volume, a longitudinal axis, a first opening and second opening being opposed along the longitudinal axis, an external surface, and the rigid wall having an interior surface of generally the shape of a deployed inflatable shell internal surface of a modular human habitat, and the internal volume being substantially that of a deployed inflatable modular human habitat volume;

a first distal enclosure having a first end and a second end being opposed along a longitudinal axis, a first aperture on the first end and a second aperture on the second end forming a passage therethrough, and the first distal enclosure is connected to the housing such that the passage aligns with the first opening of the housing thereby providing access to the internal volume; and

a second distal enclosure having a first end and a second end being opposed along a longitudinal axis, a hollow interior, and a first opening on the first end and the second distal enclosure being connected to the housing such that a

passageway is formed between the hollow interior and the internal volume.

2. The modular human habitat simulator according to claim 1 further comprising at least one longeron fixedly attached to, and extending from, the first distal enclosure through the internal volume and fixedly attached to the second distal enclosure.

3. The modular human habitat simulator according to claim 1 further comprising at least one window extending through the rigid wall into the internal volume.

4. The modular human habitat simulator according to claim 1 further comprising an opening on the second end of through the second distal enclosure thereby forming a passage to the internal volume.

5. The modular human habitat simulator according to claim 1 further including a portion of a simulated debris shield fixedly attached to the external surface.

6. The modular human habitat simulator according to claim 1 further including a plurality of simulated water bags fixedly attached to the interior surface.

7. The modular human habitat simulator according to claim 1 further comprising;

a floor structure;

means for supporting the floor structure; and

the floor structure extending substantially the length of the longitudinal axis and substantially dividing the internal volume into an upper internal space and a lower internal space.

8. A modular human habitat simulator according to claim 7 further comprising at least one access opening in the floor structure.

9. The modular human habitat simulator according to claim 1 further comprising;

a plurality of floor structures;

means for supporting the plurality of floor structure; and

the plurality of floor structures extending substantially the length of the longitudinal axis and substantially dividing the internal volume into a plurality of internal spaces.

10. A modular human habitat simulator according to claim 9 further comprising at least one access opening in at least one floor structure.

11. The modular human habitat simulator according to claim 1 further including a plurality of cylinders disposed within, and fixedly attached to, the first distal enclosure.

12. The modular human habitat simulator according to claim 1 further including a plurality of cylinders disposed within, and fixedly attached to, the second distal enclosure.

13. The modular human habitat simulator according to claim 1 further including a plurality of cylinders disposed along, and fixedly attached to, the external surface of the first distal enclosure.

14. The modular human habitat simulator according to claim 1 further including a plurality of cylinders disposed along, and fixedly attached to, the external surface of the second distal enclosure.

15. The modular human habitat simulator according to claim 1 further including a plurality of simulated panels fixedly attached to the interior surface.

16. The modular human habitat simulator according to claim 1 further including a plurality of cylinders fixedly attached to the interior surface.

17. A modular human habitat simulator comprising:

a housing having a substantially rigid wall defining an internal volume, a longitudinal axis, a first opening and a second opening being opposed along the longitudinal axis, an external surface, and the substantially rigid wall having an interior surface of generally the

shape of a deployed inflatable shell internal surface of a modular human habitat, and the internal volume being substantially that of a deployed inflatable modular human habitat volume;

a first distal enclosure having a first end and a second end being opposed along a longitudinal axis, a first aperture on the first end and a second aperture on the second end forming a passage therethrough, and the first distal enclosure is connected to the housing such that the passage aligns with the first opening of the housing thereby providing access to the internal volume;

a second distal enclosure having a first end and a second end being opposed along a longitudinal axis, a hollow interior, and a first opening on the first end and the second distal enclosure being connected to the housing such that a passageway is formed between the hollow interior and the internal volume; and

at least one longeron fixedly attached to, and extending from, the first distal enclosure through the internal volume and fixedly attached to the second distal enclosure.

18. A method of constructing a modular human habitat simulator comprising the steps of;

providing a plurality of housing segments;

assembling the housing segments into a housing having an internal volume, a first opening and second opening opposed along a longitudinal axis;

inserting at least one longeron into the internal volume;

attaching a first distal enclosure having a passage therethrough over the first opening such that the internal volume is accessible through the passage;

attaching the first distal enclosure to the longeron;

attaching a second distal enclosure having a a hollow interior over the second opening such that a passageway is formed between the internal volume and the hollow interior; and

attaching the second distal enclosure to the longeron.

19. A method of constructing a modular human habitat simulator comprising the steps of;

providing a plurality of housing segments;

assembling the housing segments into a housing having an internal volume, a first opening and second opening opposed along a longitudinal axis;

inserting at least one longeron into the internal volume;

attaching a first distal enclosure having a passage therethrough to the housing such that the passage coincides with the first opening of the housing;

attaching the first distal enclosure to the longeron;

attaching a second distal enclosure having a passageway therethrough to the housing such that the passageway coincides with the first opening of the housing; and

attaching the second distal enclosure to the longeron.

## EVIDENCE APPENDIX

There is no evidence apart from that appearing in the file history.

## RELATED PROCEEDINGS APPENDIX

There are no proceeding related to this patent application.